

ENGINE

CONTINUED FROM PRECEDING PAGE

CYLINDER HEAD INSTALLATION: See *Chevrolet Special Data*.

PISTONS: Passenger Cars. Cast alloy iron, flat head, cam ground, tin plated type with slipper skirt.

Truck Pistons. Same as Pass. Cars except heavier. Truck pistons marked with small boss on underside of each pin boss. **CAUTION**—Do not interchange pistons (must be same type in one engine).

Weight—1.56 lbs. (Pass. Cars). **Length**—3.75" (min.). **Removal**—Pistons and rods removed from above.

Clearance—Top: .0155-.0235". Skirt: Selective Fit. See Fitting New Pistons below.

Replacement Pistons: See *Chevrolet Special Data*.

NOTE—To install new pistons, hone cylinder for .005" oversize, rebore and hone for other sizes (rebore .002" less than piston oversize, finish by honing for piston clearance—see fit below). Cylinder bore taper and out-of-round must not exceed .001".

Fitting New Pistons: Use feeler gauge between piston and cylinder wall at right angles to pin bosses. Piston should pass through bore with light pressure on .002" feeler, and lock on .003" feeler.

PISTON RINGS: Two taper face compression rings (with greatest diameter at bottom), one slotted oil ring per piston, all above pin. Oil ring groove drilled for oil drainage.

Ring	Width	End Gap ^①	Side Clearance
Compr.1235-.1240"	.005-.015"	.0015-.003"
Oil Cont.1860-.1865"	.005-.015"	.002-.0035"

①—End Gap Worn Limit—1/32" max.
②—Side Clearance Checking—smaller feeler should be free, larger feeler should give a heavy drag.

Installing Compr. Rings—Side marked "TOP" up.

Replacement Rings: Furnished Standard size and .005", .020", .030", .040" Oversize.

Expander Type Rings—Furnished for use in cylinder bores of indicated oversizes as follows: Standard (Bore Std. to .009" Oversize), .020" Oversize (Bore .010" to .029" Oversize—(ring gaps must be filed for bores less than .020" Oversize), .030" Oversize (Bore .030" to .039" OS.), .040" OS. (Bore .040" to .049" OS.).

PISTON PIN: Diameter—.8645-.8650". Length 3.135-3.165". Pin locked in rod (piston bronze bushed).

Pin Fit in Piston—Thumb push fit (at room temp.).

Replacement Pins: Std. & .003", .005", .010" oversize. **NOTE**—New pistons fitted with bushings and pins. If bushings reamed, use piston pin bushing fixture to insure reaming at right angles to piston skirt.

CONNECTING ROD: Length—6 13/16". Wgt. 30.7 ozs. Crankpin Journal Diameter—2.311-2.312".

Lower Bearing—Spun high-lead, thin-wall babbitt. Clearance—.0003-.0013" selective fit (see Bearing Adjustment following).

Sideplay—.004-.012" at lower end (rod to crankpin), .015" minimum at upper end (rod to piston pin boss).

Bearing Adjustment: Solid shims. Remove shims equally at both sides to secure 'snap fit' (rod tight to hand but should snap from one side to the other with light tap of 8 oz. hammer), then replace one .002" shim on one side for clearance (if unequal number, place extra shim on camshaft side). Bearing clearance correct when rod can be snapped back and forth on crankpin with one hand (grasp bearing cap between thumb and index finger to test).

Palnut Note—Palnuts used to lock rod bolt nuts. Use new palnut (install with open side toward end

of bolt), turn palnut up finger tight against rod bolt nut, then tighten palnut 1/2 turn additional.

Installing Rods: Numbers on rods and caps must be together and installed in same numbered cylinder with numbers and pin clamp bolt toward camshaft side. Install oil dippers on rods with mouth toward camshaft side of engine. Check dipper height.

Dipper Height Adjustment—See "Oiling System" in *Chevrolet Special Data*.

CRANKSHAFT: Four-bearing type with integral counterweights and vibration dampener.

Vibration Dampener—See *Chevrolet Special Data*.

Journal Diameters—#1, 2.6835-2.6845"; #2, 2.7145-2.7155"; #3, 2.7455-2.7465"; #4, 2.7765-2.7775".

NOTE—Journal taper or out-of-round limits .001". Run-out limits for #2 and #3 journals .002".

Bearing Type—Steel-backed "Precision" type thin-wall babbitt. Do not require line-boring or reaming.

► **CAUTION**—#1 (front) and #2 (front intermediate) bearings similar in appearance but must not be interchanged. #2 bearing marked by letter "I" in oil groove. Clearance—.0007-.0024" selective fit. See Bearing Adjustment (below).

► **NOTE**—Precision type bearings can be replaced singly.

Bearing Adjustment: Solid shims. Remove shims until slight drag secured when shaft turned by hand, then replace one .002" shim on one side for clearance (if unequal number of shims used, place extra shim on same side for all bearings).

Replacement Bearings: New "Precision" type bearings furnished for all engines Std. size and .002", .010", .020", .030" Undersize.

► **Bearing Installation**—Not necessary to remove crankshaft or engine from car. See "Crankshaft & Main Bearings" in *Chevrolet Special Data*.

Bearing Cap Installation—Intermediate (#2 & 3) bearing caps marked for identification. Install #2 cap with mark "FRONT" toward front of engine, #3 cap with mark "REAR" toward rear of engine.

► **CAUTION**—Rear intermediate (#3) bearing is special flanged type (takes end thrust).

Crankshaft Oil Seal Servicing: See *Chevrolet Special Data* for Front (Timing Gear Cover) and Rear Oil Seals.

End Thrust: Taken by #3 (rear intermediate) bearing. To check endplay, force crankshaft to rear, check clearance at rear of #3 bearing. Adjust by replacing bearing. Endplay—.003-.009".

CAMSHAFT: Four bearing type. Helical gear drive.

Journal Diameters—#1, 2.0282-2.0292"; #2, 1.9657-1.9667"; #3, 1.9032-1.9042"; #4, 1.8407-1.8417".

NOTE—Journal out-of-round limits .001". Run-out limits .002" (straighten if run-out excessive).

Bearing Type—Steel-backed, babbitt-lined bushings (staked in place). **NOTE**—New bearings must be line-reamed. Clearance—.002-.004".

Bearing Installation—See *Chevrolet Special Data*.

End Thrust: Taken by thrust plate behind camshaft gear (gear position on shaft controls endplay).

Endplay Adjustment—See *Chevrolet Special Data*.

Endplay—Free fit to .003" maximum.

Timing Gears: Crankshaft gear steel. Camshaft gear Bakelite and Fabric composition.

Max. Gear Runout—.003" crankshaft, .004" camshaft.

► **235" Truck Engine Timing Gear Set**—Aluminum camshaft gear with bonded steel hub used with crankshaft gear having crowned teeth.

Replacement Timing Gears, and Gear Installation & Alignment—See *Chevrolet Special Data*.

Timing Gear Backlash—.003-.004".

Camshaft Setting: Gears punch marked. Punch marks on both gears must be lined up and directly opposite each other.

VALVES:	Head Diam.	Stem Diam.	Length
Intake	1 41/64"	.3410-.3417"	6.260-6.290"
Exhaust	1 15/32"	.3400-.3407"	4.839-4.869"

	Seat Angle	Lift	Stem Clearance
Intake	30°	.2941"	.001-.003"
Exhaust	30°	.3118"	.002-.004"

NOTE—Intake valves have flat head.

Valve Installation (with rubber Valve Stem Oil Seals): Special synthetic rubber oil seal ring installed in groove in valve stem directly below seat locks (retained by valve cap).

NOTE—Longer valve spring cap is used (interchangeable for intake & exhaust valves—may be identified by 1/16" annular groove on top surface). No cap covers used with this type assembly.

Valve Stem Oil Seal Installation—See "Valve System" in *Chevrolet Special Data*.

Valve Guides: New precision type. Pressed in head.

Valve Guide Installation—See "Valve System" in *Chevrolet Special Data*.

Valve Springs: Install springs with closed-coil end toward cylinder head. Check springs with KMO-607 Tester, replace if outside limits of 124-140 lbs. at 1 1/2". Spring free length 2 5/8".

	Spring Pressure	Length
Valve Closed	53-63 lbs.	1.821"
Valve Open	124-140 lbs.	1.505"

Valve Lifters: Barrel type with pushrod seat brazed on upper end. Lifter diameter .989-.990". Clearance—.001" (selective free fit).

Rocker Arm Assembly: Armasteel type (no bushings). Four types of rocker arms used as follows:

Intake—No. 839463 (Left), 839464 (Right).

Exhaust—No. 839459 (Left), 839460 (Right).

Rocker Shaft Diameter—.7910-.7917" (bore diameter in rocker arm .7925-.7935").

Rocker Arm Assembly & Installation—See "Valve System" in *Chevrolet Special Data*.

VALVE TIMING

► **VALVE TAPPET CLEARANCE:** **CAUTION**—Engine temperature must be "normalized" before adjusting. See "Tappet Clearance Adjustment" in *Chevrolet Special Data*.

Setting (with Engine "Normalized")—.006-.008" Intake, .013-.015" Exhaust.

Valve Timing: See Camshaft Setting above.

Intake Valves—Open 1° ATDC. Close 39° ALDC.

Exhaust Valves—Open 42° BLDC. Close 9° ATDC.

Valve Timing Check—Remove all tappet clearance from #1 exhaust valve, turn engine over until this valve just starts to close and until triangular flywheel mark lines up with pointer in right front face of flywheel housing, mount dial indicator on rocker shaft support with stem contacting #1 exhaust valve adjusting screw, set indicator dial at .044". Turn crankshaft until indicator hand just stops moving. Timing is correct if indicator reading is ZERO plus or minus .004". Reset tappet clearance at correct running figure (above).

LUBRICATION

Engine Oiling System: Pressure and positive splash system. Pressure to main bearings, camshaft bearings, timing gears, and to overhead valve system (low pressure). Connecting rod bearings lubricated by oil dippers which scoop oil from troughs (low